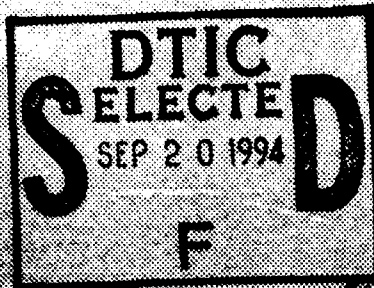


Navy Personnel Research and Development Center

San Diego, CA 92152-7250

AP-94-7

August 1994



Command History Calendar Year 1993

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August 1994

Command History Calendar Year 1993

Reviewed and approved by
Carmen Fendelman

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Introduction

The Navy Personnel Research and Development Center (NPRDC) Command History for CY93 is submitted in conformance with OPNAVINST 5750.12. The history provides a permanent record of CY93 activities.

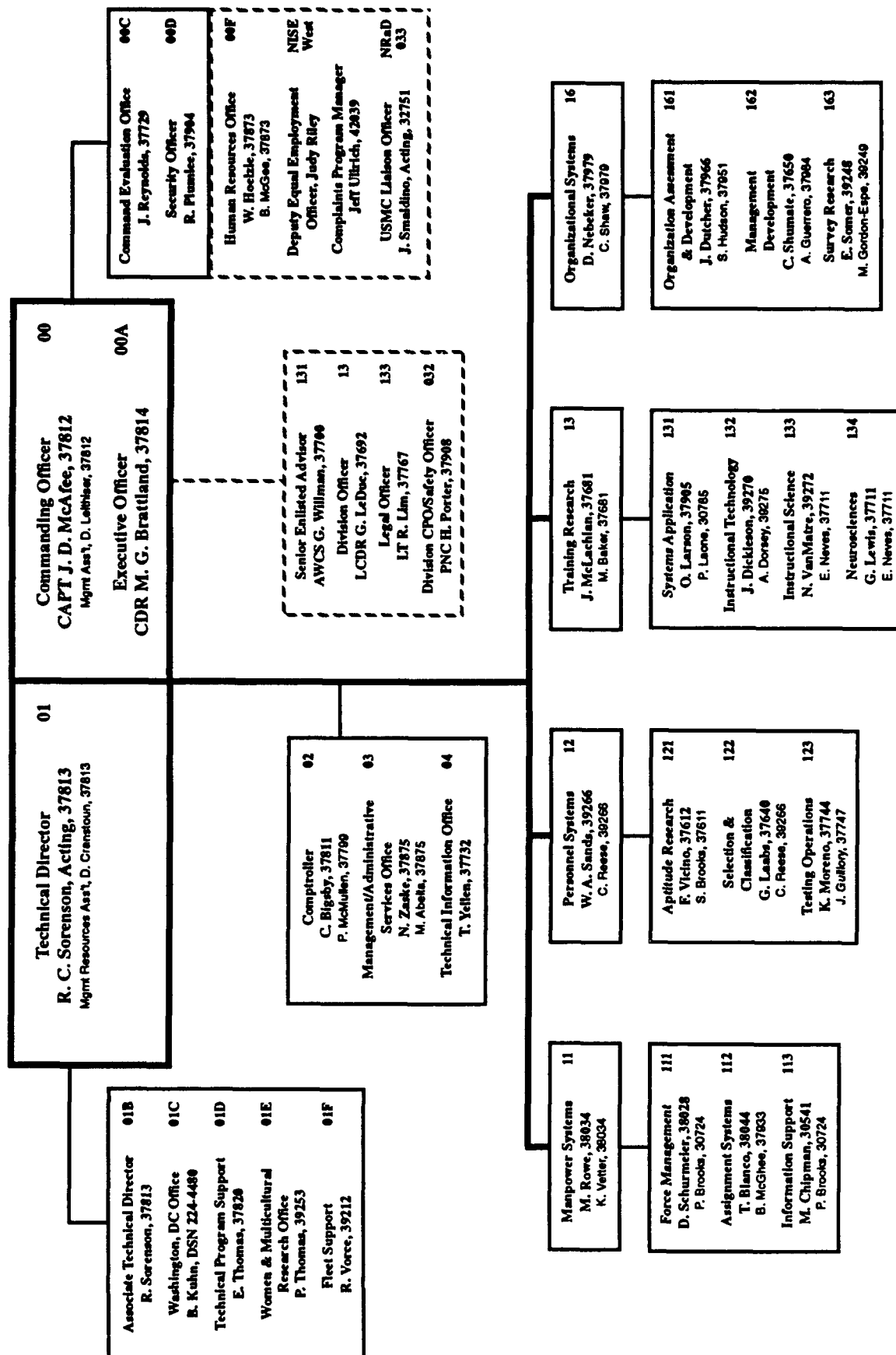
Operating Philosophy

NPRDC is an applied research center, contributing to the personnel readiness of the Navy and Marine Corps. The Center develops better ways to attract qualified people to the naval services to: select the best, assign them where they are most needed, train each one effectively and efficiently, and manage our personnel resources optimally. By combining a deep understanding of operational requirements with first-rate scientific and technical abilities, the Center is unique in being able to develop new, useful knowledge and refine technology to address people-related issues. This dual expertise permits the Center to develop the technology base for improving the use of human resources within Navy systems and to apply state-of-the-art technology to solve emerging problems. The organizational structure of NPRDC is represented in Figure 1. As a corporate asset, NPRDC is responsive to the needs of manpower, personnel, and training managers in the Navy, Marine Corps, and Department of Defense (DOD); to the operating forces; and to the shore establishment that trains and supports the fleet.

The research and development (R&D) methods used by NPRDC are derived from behavioral, cognitive, economic, and social sciences as well as from applied mathematics and statistics. The application of these methods results in tangible products of use to the Navy and Marine Corps. NPRDC constantly searches for technological opportunities to improve personnel readiness and to reduce manpower costs. We are accountable to the Chief of Naval Personnel (CNP), our sponsors, and our users for high productivity, strict ethics, honesty, integrity, professionalism, and perspective. The Center's reporting relationship is depicted in Figure 2.

As part of its operating philosophy, NPRDC seeks to do as much of its work as possible in operational setting where the final products of our efforts are intended to be used. This helps to ensure that the needs and requirements of the users are met and that the users themselves become familiar with the operational capabilities of the particular products. In some cases, because of the close researcher and user interaction, interim or prototype products have been put into use before the final product has been completed. Examples of NPRDC's on-site research applications are shown in Appendix A.

Further interactions with operational commands involve a variety of manpower, personnel, and training (MPT) databases that NPRDC has developed and maintained. Because NPRDC is an in-house, corporate laboratory, these databases are readily available to support many different operational users and requirements. The databases, descriptions, and principal users are shown in Appendix B.



18 August 1993

Figure 1. NPRDC organization.

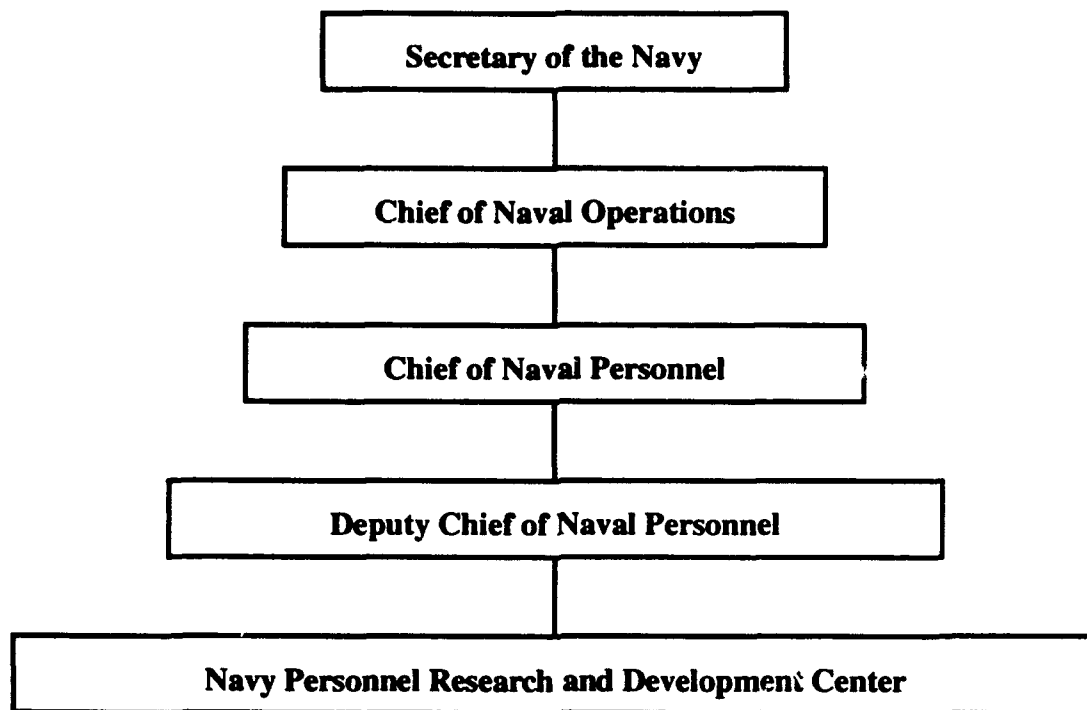


Figure 2. 1993 reporting relationships (Department of the Navy Research, Development, Testing, and Evaluation Organization).

Commanding Officer's Biography

Captain John D. McAfee was born in Mariemount, OH on 31 October 1947 and was raised in Somers Point, NJ. He received his Bachelor of Science degree from Xavier University in 1969 and was commissioned on 6 February 1970 through the Aviation Officer Candidate Program. He was designated a Naval Aviator on 3 December 1970. His first assignment was to Helicopter Attack Squadron Light THREE in the Republic of Vietnam from April 1971 to March 1972, where he flew close air support of U.S. Navy Riverine and SEAL Units assigned to TASK FORCE 116.

In 1972, Captain McAfee was assigned to Helicopter Anti-Submarine Squadron SIX at Naval Air Station Imperial Beach, CA. During this tour of duty he embarked for two Western Pacific deployments with Carrier Air Group NINE in USS CONSTELLATION (CV-64).

Following this tour, Captain McAfee was selected as personal aide to Commander, Naval Air Forces, U. S. Atlantic Fleet and was further assigned in 1975 as personal aide to the Chief of Naval Material. After graduation from the Naval War College in 1977, Captain McAfee reported to Helicopter Anti-Submarine Squadron Light THREE-SEVEN, Naval Air Station Barbers Point, Hawaii where he was a detachment Officer in Charge in the USS DAVIDSON (FF-1040). From 1980 to 1982, he was assigned to Commander, THIRD Fleet, Pearl Harbor as Fleet Services Officer.

In 1982, Captain McAfee joined Helicopter Anti-Submarine Squadron Light THREE-THREE, Naval Air Station North Island as a detachment Officer in Charge in USS HEWITT (DD-966) and as Squadron Operations Officer. He reported to the Deputy Chief of Naval Operations (Air Warfare) as the LAMPS Program Coordinator in April 1985. Captain McAfee established and assumed command of Helicopter Anti-Submarine Squadron Light FOUR-SEVEN in September 1987.

Following his command tour, Captain McAfee was assigned to USS CONSTELLATION (CV-64) as Navigator. In June 1990, he was assigned to the NATO arm of U.S. SIXTH Fleet as Commander, Striking and Support Forces, Southern Europe Representative, Izmir, Turkey.

Since November 1992, Captain McAfee has served as Commanding Officer of the Navy Personnel Research and Development Center, San Diego, CA.

Captain McAfee holds a Masters degree in Systems Management from the University of Southern California and is a graduate of the Defense Systems Management College, Fort Belvoir, VA. His awards include: Defense Superior Service Medal, three Meritorious Service medals, Air Medal (12 Strike Flight Awards), two Navy Commendation Medals and the Navy Achievement Medal, Southwest Asia Service Medal, Presidential Unit Citation, Meritorious Unit Commendation, and Vietnamese Gallantry Cross.

He is married to the former Susan M. Braverman of Somers Point, NJ.

Technical Director's Biography

Dr. Richard C. Sorenson has served as the Acting Technical Director, NPRDC since February 1990.

He has been employed at the Center since its formation in 1973 and has planned, directed, and carried out research and development in personnel, training, human factors, neurosciences, and organizational systems. Since 1988, he has been the Associate Technical Director.

Before the Center was formed, Dr. Sorenson was on the staff of the Naval Personnel and Training Research Laboratory, the Army Research Institute, the American University, and the University of Washington.

Dr. Sorenson received his B.S. degree from the University of Idaho in 1959, and his M.S. and Ph.D. degrees from the University of Washington in 1962 and 1965 majoring in psychology. Later he studied mathematics, statistics, and economics at George Washington University. He is a licensed psychologist.

Dr. Sorenson was the recipient of the 1989 NPRDC Professional Publications Award and the 1990 Commander's Award for Management Excellence. He is a fellow of the American Association for the Advancement of Science. He is the author of over 40 professional contributions including book chapters, journal articles, and papers presented at professional meetings.

Dr. Sorenson is married to the former Bertha Hartung.

History

- 1 July 1951 The Naval Personnel Research Unit, San Diego, CA was established under the Bureau of Naval Personnel (BUPERS) to provide a personnel research facility close to the operating forces.
- 1 July 1952 The U.S. Naval Personnel Research Field Activity was established in Washington, DC to provide an activity close to Navy users and systems.
- 26 May 1961 SECNAV Notice 5450 redesignated the two field activities as U.S. Naval Personnel Research Activities.
- 10 December 1968 OPNAV Notice 5450 redesignated the Naval Personnel Research Activity, Washington, DC as the Naval Personnel Research and Development Laboratory due to increased emphasis on R&D.
- 1 August 1969 The Chief of Naval Operations (CNO) redesignated the Naval Personnel Research Activity, San Diego, CA as the Naval Personnel and Training Research Laboratory.
- 1 May 1973 The Secretary of the Navy approved the establishment of NPRDC, San Diego, CA to provide a corporate personnel laboratory with an in-depth capability in the behavioral and management sciences. This action consolidated those research functions assigned to the Naval Personnel Research and Development Laboratory, the Naval Personnel and Training Research Laboratory, and the Personnel Research Division of BUPERS.
- 17 May 1975 OPNAV Notice 5450 changed command and support responsibility for NPRDC from the CNP to the Chief of Naval Material (CNM).
- 22 May 1980 NAVMATINST 5450.27B modified the mission statement to include technical and consultant support and services to CNO in the design, development, and operation of the Navy personnel system.
- 1 October 1980 The Commanding Officer, NPRDC directed to report for additional duty to Deputy CNO (Manpower, Personnel, and Training) (OP-01).
- 6 May 1985 The disestablishment of CNM changed command and support responsibility for NPRDC from CNM to Chief of Naval Research (CNR).
- 24 February 1986 The Secretary of the Navy changed command and support responsibility for NPRDC from CNR to Space and Naval Warfare Systems Command (SPAWAR).
- 27 March 1988 Management control of NPRDC was transferred from SPAWAR to CNP/Commander, Naval Military Personnel Command (NMPC). NMPC was charged with direct management of NPRDC.
- 12 September 1991 OPNAV Notice 5450 disestablished NMPC and delegated BUPERS with direct management of NPRDC.

25 September 1991 OPNAV Notice 5450 modified NPRDC's mission to conduct research and development to improve the performance of individuals, teams, and organizations within the Navy and Marine Corps; to provide products and services specifically directed at improving Department of the Navy personnel planning, testing, acquisition, selection, classification, training, utilization, motivation, organization, management, and other contemporary issues; and to perform other functions as directed by higher authority.

Organization

Mission

To conduct R&D to improve the performance of individuals, teams, and organizations within the Navy and Marine Corps. To provide products and services specifically directed at improving Department of the Navy (DON) personnel planning, testing, acquisition, selection, classification, training, utilization, motivation, organization, management, and other contemporary issues.

Philosophy

We believe people are the most valuable resource of the Navy and Marine Corps. People have the unique capability to take action based on objectives and values in rapidly changing environments. We believe, therefore, that improving the ability of people to perform their assigned tasks is necessary to maximize the effectiveness of weapon systems. Moreover, we believe our efforts will improve the quality of service life and the effectiveness of MPT, and organizational systems and result in a more effective naval force.

Vision

For the Navy and the Marine Corps, the current decade will be the beginning of an era of new missions, changing force structure, and shifting priorities. Each Service will prepare itself to be ready at all times to conduct a large number of varied operations in potentially hostile environments. New capabilities and technologies will be developed to meet the challenges of these new responsibilities and threats. Of critical importance will be the continuing need to attract and retain a professional personnel force of the very brightest and most capable young people in the nation.

Through this period and beyond, we see NPRDC continuing to grow in leadership and influence as the Navy and the Marine Corps' principal center for MPT and organizational systems R&D. We will be recognized for our innovation, initiative, the teamwork of our people, and our ability to anticipate and effectively respond to change.

Our principal value will continue to be in the products and services we provide. As an integral part of the Navy and Marine Corps family, we are motivated and able to seek out and solve the most important Navy and Marine Corps problems within our mission area. We are committed to developing close working relationships with our sponsors and customers and to meeting their needs in a timely, cost-efficient, scientifically valid manner.

Our major strength will continue to be our staff whose talents cover a broad range of technical disciplines. We are proud of the research scientists who, along with members of the support staff, contribute so much to enhancing the Center's reputation within the operational and scientific communities. We will build on this strength by developing and expanding the skills of the present

staff and hiring new individuals as needed to respond effectively to a wide variety of Navy and Marine Corps problems and opportunities.

As a R&D activity, we will continue to fulfill our responsibility to identify and test the applicability of current and emerging scientific technologies to the solution of Navy and Marine Corps MPT and organization systems problems. We will strive to maintain our recognized expertise in the core technologies associated with manpower modeling; ability, interest, and attitude measurement; instructional design; organizational evaluation; and quality management. At the same time, we will develop new technologies in these areas.

In pursuing this vision, we will strive for continuous improvement in the quality of our internal operations and in the products and services we provide. We will establish meaningful, measurable goals and procedures for assessing progress in attaining them. We will recognize and reward the contributions of our staff. We will remain open to change and flexible in setting future directions and strategies. We are confident that these actions, in total, will assure our continued role in helping to build a stronger and more effective Navy and Marine Corps.

Goals

1. Design and develop MPT and organizational systems products and services that significantly enhance the ability of the Navy and Marine Corps to carry out their missions.
2. Attract, develop, and retain talented and motivated personnel through Center policies and practices that foster and reward proactive behavior, teamwork, communication, trust, risk taking, and innovation.
3. Conduct a technology base program (i.e., basic research, exploratory development, and advanced technology demonstrations) to meet Navy and Marine Corps personnel and operational requirements and to maintain scientific and technical leadership in MPT and organizational systems areas.
4. Maintain in-house scientific expertise and corporate knowledge to ensure technological innovation, "smart buyer" assistance, and real-world understanding of MPT and organizational systems requirements.
5. Anticipate future needs of NPRDC sponsors and customers and meet them through use of appropriate technology, prioritization of R&D requirements, and by facilitating transitions of products into operational use.
6. Seek continuous improvement in the quality of NPRDC products and services, and the way they are applied to naval systems.

Functions

1. Plans and develops effective MPT and organizational systems products and services for Navy and Marine Corps operational application. Provides technical assistance to support the transition and implementation of Center products.

2. Develops and maintains in-house Navy and Marine Corps scientific and technical expertise to provide corporate knowledge, corporate memory, technological innovation, "smart buyer" assistance, and real-world understanding necessary for the development and support of Navy and Marine Corps MPT and organizational systems.

3. Plans and conducts an effective technology base program (basic research, exploratory development, and advanced technology demonstrations) to meet existing and projected operational requirements and to maintain scientific and technical leadership in MPT and organizational areas.

4. Develops new systems and methods for determining manpower requirements, allocating manpower resources, developing personnel inventories, and distributing/assigning those inventories to improve military readiness and control costs.

5. Develops new systems and procedures for recruiting, selecting, classifying, and utilizing officer, enlisted, and civilian personnel to improve performance, satisfaction, and retention.

6. Serves as the CNP's primary resource to coordinate and conduct personnel surveys in the Navy and to develop new survey methodology for the Navy and Marine Corps.

7. Develops and evaluates personnel testing systems, and Computerized Adaptive Testing for Armed Services Vocational Aptitude Battery (CAT-ASVAB). Serves as Lead DOD R&D laboratory for overall management of CAT research, development, implementation, and scientific support of the system.

8. Develops training technologies to enhance personnel readiness.

9. Employs existing and emerging technologies in the development and application of training systems to alleviate Navy and Marine Corps training problems and improve the Navy's operational readiness.

10. Develops and evaluates innovative management and leadership systems for improving the effectiveness and readiness of Navy and Marine Corps personnel and organizations.

11. Develops and evaluates innovative motivation and reward systems for improving the efficiency and effectiveness of Navy and Marine Corps personnel and organizations.

12. Develops and evaluates educational material on innovative management and leadership systems for Navy and Marine Corps personnel and organizations.

13. Develops methods, procedures, and instruments for assessing the effectiveness and efficiency of management and leadership practices in Navy and Marine Corps organizations.

14. Develops, evaluates, and applies innovative personnel assessment technology.
15. Provides independent analyses, technical advice, and consultation to research, development, test, and evaluation (RDT&E) and operational managers in matters related to the Center's mission.
16. Investigates, defines, and addresses operational problems related to fleet personnel performance.
17. Maintains a field office in Washington, DC for the purpose of conducting on-site projects.
18. Develops, installs, and provides life-cycle support for information management systems.
19. Provides information and reports to higher authority and the scientific community on the progress and accomplishments of the Center's program.
20. Provides technical support in the development of the CNP's long range plan with regard to the infusion of appropriate technology, definition and prioritization of RDT&E requirements and the transition of products into operational use.
21. Provides information and technical support to the Center's BUPERS Program Manager in all matters related to the Center's operation.
22. Develops and maintains liaison with Navy, DOD, and civilian RDT&E organizations for the exchange of information and the establishment of cooperative efforts in MPT and organizational systems areas.

Center Resources

Funding

NPRDC operates under the RDT&E Resources Management System. Under this system, the final fiscal responsibility resides with the Commanding Officer and certain financial responsibilities are delegated to cost center managers. The reporting procedures associated with the Resources Management System provide financial information for both internal management and higher authority.

The principal mission sponsor and prime "customer" for Center RDT&E products is OP-01/BUPERS. Significant sponsorship also comes from the CNR, the Marine Corps, and other Navy and DOD organizations including the Systems Commands. The majority of RDT&E that the Center conducts is supported by directly funded projects. A small portion of the funds are independent research and independent exploratory development. In addition, a substantial portion of research, development, and analysis consists of "reimbursables," specific problem solving efforts requested by, and supported with funding from other organizations.

NPRDC's funding for the end of FY93 was \$30.1 million. Distribution, source, and appropriation of funds are shown in Figures 3 and 4.

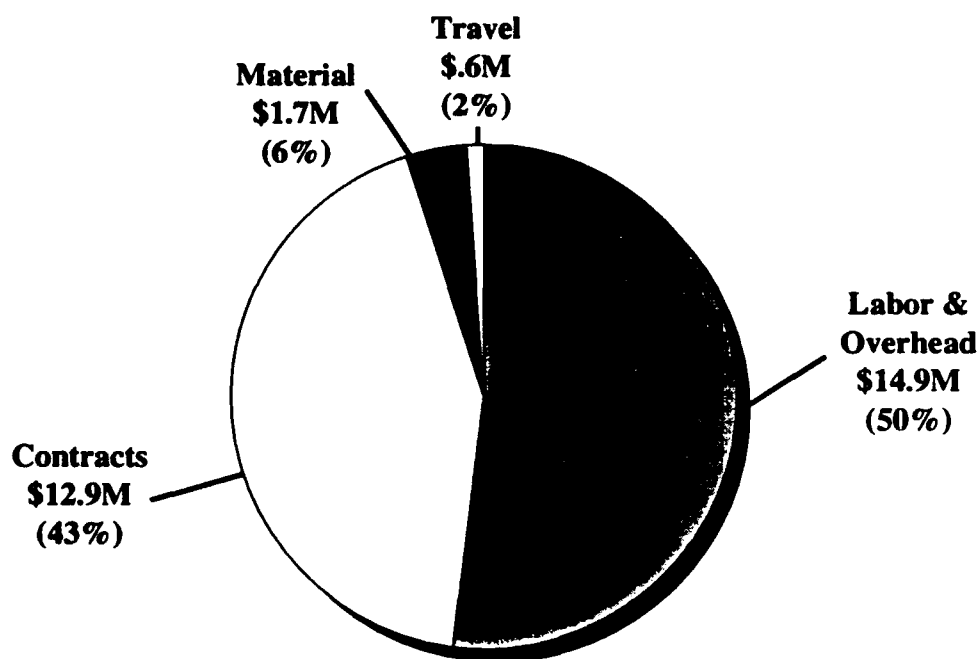


Figure 3. Distribution of funds (\$30.1M, 30 September 1993).

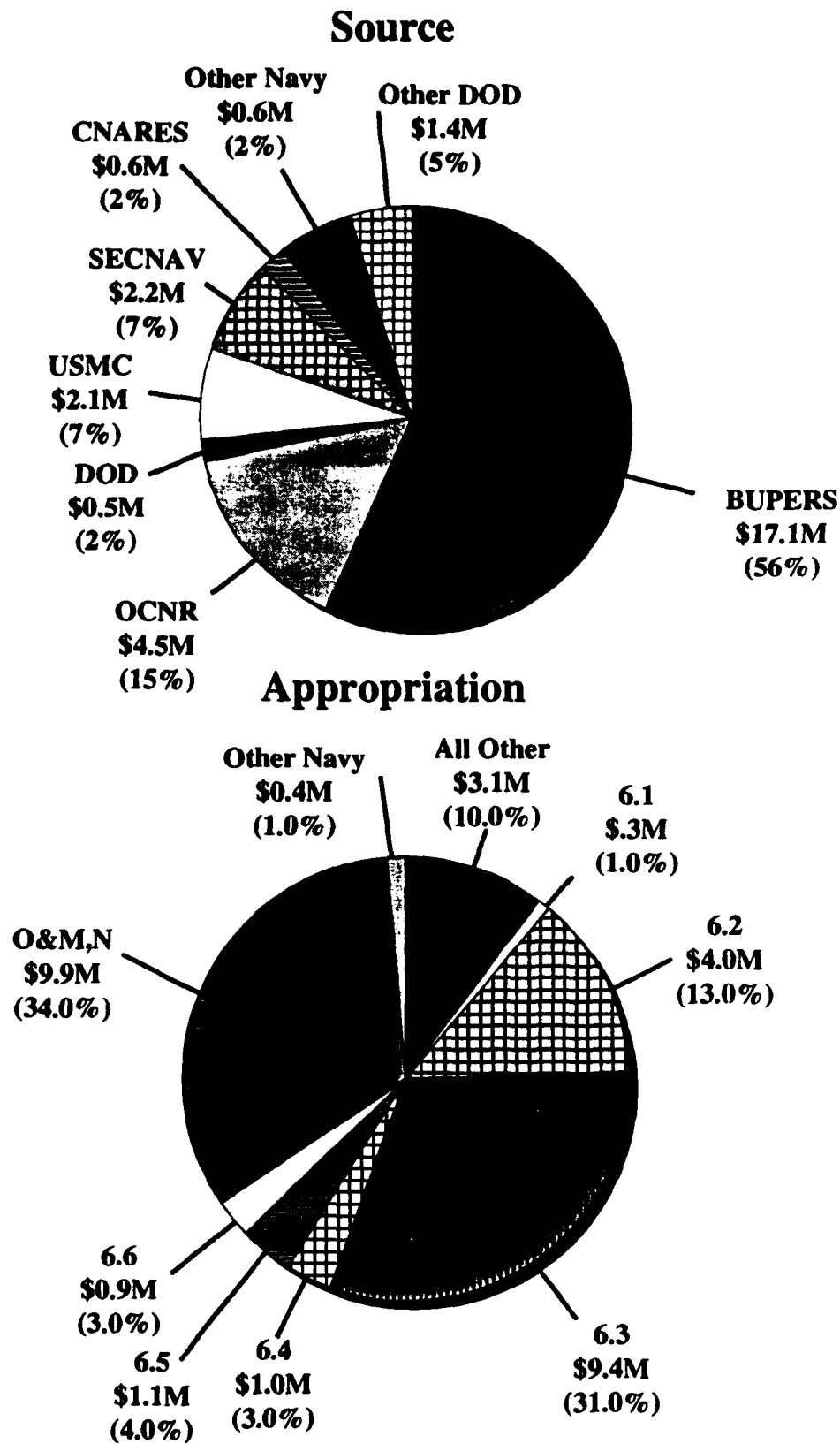


Figure 4. Funding by source and appropriation (\$30.1M, 30 September 1993).

Personnel

Because R&D programs at NPRDC are mission-oriented, it is essential that the research force be multidisciplinary so that early consideration may be given to alternative approaches in research endeavors. The Center's staff is creatively diverse and equipped to meet this prerequisite.

As of 30 September 1993, the staff numbered 21 military and 228 civilian personnel. Of the civilians, 155 are professional and technical personnel representing a variety of disciplines. Of the professional and technical staff, 80% hold advanced degrees. The military staff consists of line officers and senior enlisted personnel. The military personnel offer extensive fleet and subject-matter expertise that helps ensure the operational relevance of NPRDC's R&D endeavors. This broad personnel base allows NPRDC to maintain a highly effective, multidisciplinary team approach to its R&D.

Facilities

NPRDC is located on Point Loma in San Diego, CA, with support offices in Washington, DC. The Center occupies 16 buildings under a host-tenant arrangement with the Naval Command, Control and Ocean Surveillance Center, RDT&E Division (NRaD). In addition to office space for research and support personnel, the following research facilities are housed at the Center:

- **Training Research Computing Facility (TRCF)** provides general Unix-based computing services and access to the Defense Data Network for Center research and support staff. The facility is supported by the Training Technology Department and provides computational and electronic mail support for research in areas of artificial intelligence, computer-assisted instruction, cognitive science, testing, and training. The TRCF equipment suite includes two Digital Equipment Corporation VAX-11/780 computers and numerous peripherals.
- **Manpower and Personnel Computing Facility (MAPCOM)** provides general purpose IBM-based computing services for Center researchers and administrative operations. The facility is supported by the Manpower Systems Department. It is specially equipped to serve psychologists, economists, mathematicians, and computer scientists whose research requires the organization and analysis of large data files, the development of large-scale mathematical models, the design of information delivery systems, and general-purpose scientific computing. The MAPCOM features an IBM 4381/23, multiple tape drives, and over 25G in disk storage.
- **Systems Simulation Facility** serves cognitive and organizational psychologists who are concerned with the measurement of human performance, neuroscience applications in personnel readiness assessment, and motivation of people in organizations. It includes equipment for biopsychological and psychophysiological measurement.

Research and Development Program

The R&D program at NPRDC addresses four functional areas: Manpower, Personnel, Training, and Organizational Systems. Within these four functional areas are 21 product lines, each of which has one or more projects.

Manpower

Develops new computer-based systems and methods for allocating manpower resources, developing personnel inventories, and distributing/assigning those personnel to improve military readiness and control costs.

- **Navy Force Management**—Designs/develops large-scale decision-support systems for managing the flow of personnel (accession, retention, promotion) to attain desired skill inventories within constraints of cost and feasibility, allocating manpower resources, and developing and executing manpower appropriations.
- **USMC Force Management**—Designs/develops systems to develop, evaluate, justify, and effectively execute USMC manpower plans and policies.
- **Assignment Systems**—Designs/develops systems for improving the assignment of officer and enlisted personnel to jobs (billets) given cost constraints, fleet requirements, individual preferences, and a wide variety of assignment policies.
- **Recruiting Systems**—Develops market analyses, supply projections, resource management models and systems to support accession policy and recruiting objectives.
- **Training Resources Systems**—Improves fleet readiness and cost-effectiveness of training assets by designing/developing methods for scheduling classes, reserving seats, monitoring bookings, and reallocating school seats.
- **MPT Information Support**—Develops advanced information systems architectures; database storage and retrieval technologies; and user interface designs for MPT applications.

Personnel

Develops and evaluates systems for recruiting, selecting, classifying, and utilizing military personnel to improve performance. Serves as the lead DOD R&D laboratory for the development of a Computerized Adaptive Testing for Armed Services Vocational Aptitude Battery (CAT-ASVAB).

- **Printed Testing**—Establishes and monitors Navy enlistment qualifications and school eligibility standards for the ASVAB. Develops biographical information instruments for use in enlisted personnel screening.

- **Computerized Testing**—Develops CAT-ASVAB as a replacement for the paper-and-pencil version of the battery. Includes development of new computerized ability tests which can be used to augment the battery.
- **Personnel Classification**—Develops job performance measures for use in validating selection and classification tests. Develops mathematical modeling procedures to assist in establishing recruit quality requirements and person-job matching techniques.
- **Officer Career Management**—Develops and applies new technology to match officer attributes and billeting requirements in a changing environment.
- **Drug Research**—Develops new methods for maximizing drug use deterrence while minimizing drug use detection costs.

Training

Develops new educational and training technologies to reduce formal Navy training costs and to improve Navy training effectiveness.

- **Operational Training**—Develops training programs to support specific operational weapons systems including enhancements to existing programs and application of emerging training technologies to these systems.
- **Schoolhouse Training**—Develops content specific instructional materials and processes designed to enhance the effectiveness and lessen the cost of the delivery of formal Navy schoolhouse instruction.
- **Neurosciences**—Develops and evaluates technologies to assess and enhance performance and training procedures using neuroscience, neural network, and behavioral approaches. Performs R&D for improved assessment of human capabilities, including sensory and cognitive processing, skill development and retention, real-time monitoring, and on-job performance prediction.
- **Curriculum Acquisition, Development, and Revision**—Develops, tests, and evaluates systems designed to support the development of curriculum materials. These include automated systems designed to support instructor delivered training materials and systems for computer delivered training materials.
- **USMC Training**—Develops prototype training programs to support unique Marine Corps applications. These include materials supporting either basic schools or operational units.

Organizational Systems

Develops and evaluates performance enhancement and control systems for improving the effectiveness, quality, and productivity of defense personnel and organizations. Develops

approaches for managing a diverse workforce. Serves as the CNO's primary resource to coordinate and conduct attitude surveys in the Navy and Marine Corps and to develop new survey technology.

- **Management Control Systems**—Performs needs analyses for the purpose of diagnosing problems with existing systems used for cost, quality, production control, and improvement. Determines appropriate enhancements to such systems and provides models for system development. This frequently includes design, development, and evaluation of management training for quality and productivity improvement.
- **Incentive Systems**—Determines feasibility, design, development, test, and evaluation of incentives in Navy organizations. This includes monetary and nonmonetary applications for individual, group, and organization. Nonmonetary types include performance measurement, feedback, goal setting, time off, suggestion systems, employee involvement, and job redesign.
- **Organizational Systems Evaluation**—Includes diagnostics of organizations, their designs, functions, and "climate" or culture. Also includes evaluation of programs that have aimed to change these factors.
- **Survey Research**—Develops systems to improve the quality and timeliness of personnel survey data.
- **Women and Multicultural Research**—Investigates issues associated with a racial-, ethnic-, and gender-mixed active duty and civilian workforce.

Other research efforts include developing and testing innovative methods to design, administer, and evaluate management and professional training. In addition, job aids are developed and tested to determine their effects on workload accomplishment.

Fleet Liaison Office

In addition, NPRDC has set up a Fleet Liaison Office (FLO) to maintain liaison with Fleet Commands, Type Commands, Systems Commands, CNO Agencies, and R&D Centers in matters related to NPRDC's mission areas, and serves as the Center's focal point for investigating and responding to requests for technical assistance. It monitors on a continuing basis operational problems, requirements, and priorities to determine RDT&E implications, provides on-site consultative services to operational commands and performs special projects as needed and facilitates the implementation of the Center's R&D products. The FLO serves as the Center's agent for the Navy Science Assistance Program and is closely linked to this program's management, training, and quality assurance.

Technical Accomplishments¹

Pacer Share: Fourth-Year Evaluation

The Office of Personnel Management requested that NPRDC researchers conduct a fourth-year, fifth-year and summative evaluation of the *Pacer Share* Project. A reform effort hosted by the Air Force and the Defense Logistics Agency, the Pacer Share Demonstration Project was designed to implement and test a more flexible, responsive, and streamlined personnel system. Another goal was to develop new ways of motivating employees to improve organizational performance.

Operating under the authority of the Title VI of the Civil Service Reform Act, the project was formally approved by the Office of Personnel Management and published in the Federal Register. *Drs. Joyce Shettel-Dutcher and John Sheposh, and David Dickason* studied six areas of change that comprised the Pacer Share Project: paybanding/grade consolidation, job series consolidation, revised supervisory grading criteria, elimination of individual performance appraisal, demonstration on-call program, and productivity gainsharing.

The project has contributed information regarding the adoption and use of specific initiatives as well as preliminary understanding of the transformation of a traditional Federal Civil Service organization to a Total Quality Management organization. NPRDC has completed and submitted the fourth-year evaluation report assessing the impact of the initiatives, and will complete the fifth-year and summative evaluations in 1993.

Officer Information Delivery System

The *PC-Based Officer Personnel Information System (PC-OPIS)* provides rapid, easy access to aggregated, historical officer inventory and personnel flows from FY75 to the present. Specifically, PC-OPIS data include inventories, losses, lateral transfers, promotions, promotion opportunities, gains, time remaining under obligation, and retention. Users can view the data by designator, grade, length of service, source of entry, gender, and ethnic group. The system displays counts, rates, averages, and ratios for most of these data types. The information is displayed in tabular or graphic format and is exportable directly to other applications (e.g., Lotus 1-2-3, dBase, etc.).

PC-OPIS is installed at BUPERS-21 (the Officer Plans and Analysis Division) on a local area network and serves approximately 30 officer community managers and analysts. The PC version

¹ The Technical Director awards individuals and work teams for exemplary technical accomplishment contributing to the Center mission. As an applied research center, NPRDC's principal goal is to apply state-of-the-art technology to solve emerging problems affecting Navy and Marine Corps personnel readiness. The attainment of this goal is manifested in tangible products of operational use to Navy and Marine Corps commands. The focus of this special Technical Director award is on those exemplary technical accomplishments that result in products of significant value to particular user commands.

of OPIS is more readily accessible and user friendly than the former mainframe version. A user manual and on-line help system provide operational guidance.

The information generated by PC-OPIS is used to analyze trends in key officer force management measures (e.g., retention rates) and develop officer plans. The historical data for PC-OPIS are compiled from NPRDC's automated historical officer data processing system (FAIM-O). *Mark Chipman* and *James Mosteller* provide annual updates to PC-OPIS. PC-OPIS will also be installed at the Naval Postgraduate School (NPS) during the next year. A variety of NPS students use the PC-OPIS data in support of their thesis topics.

"C" School Costing Model

The smooth flow of students to "C" school training will be achieved with the Navy's ability to control, allocate, and manage program costs. The *"C" School Costing Model* allows enlisted community managers to successfully plan student and funding allocations during their intensive annual Navy Enlisted Community planning conference with detailers, Chief of Naval Education and Training, and warfare sponsors.

The software program, developed by *Steve Sorensen* and *Joseph Joy*, provides realistic, real-time feedback on the training plan. For the first time ever, enlisted community managers are able to accurately predict their future training costs based on the plan.

Expanding the capabilities of the model, a modification of the program is now under development which will be used by detailers throughout the year to track allocations as they occur and assist in planning.

Systems Approach to Process Improvement

In an attempt to help Navy organizations optimize their performance, NPRDC researchers, in a joint venture with the Total Quality Leadership Office (TQLO), developed a course that provides a road map to such improvements.

This newly established course, the *Systems Approach to Process Improvement (SAPI)*, is one of a series of TQL courses sponsored by CNET and the TQLO under the auspices of the Assistant Secretary of the Navy. SAPI, providing a larger perspective and deeper understanding of systems environments, is intended to prepare TQL command Quality Advisors to guide their organizations in the activities required to improve processes.

Sam Landau and *Paula Konoske* (NPRDC) and *Antonio Rodriguez* (TQLO), developed this two week course. The course describes a model that integrates systems knowledge with statistical process control tools. It discusses ways to identify and prioritize stakeholders and processes, how to improve these processes, and how to maintain these improvements.

SAPI will be taught at the Naval Amphibious Base, Coronado, and at Little Creek, VA.

Enlisted Retirement Model

The *Enlisted Retirement Model (RETIR)* forecasts retirements and Fleet Reserve transfers for all enlisted personnel on active duty. RETIR, an EXCEL spreadsheet model, forecasts retirements for a four year sequence in monthly intervals by estimating retirement losses for each combination of pay grade and years active service. In addition to these "baseline" retirements, the model calculate the effect of different kinds of early retirement policies, including retirements with as little as 15 years service and retirements due to changes in High year Tenure policies.

To successfully forecast retirements for a sequence of years, the time-eligible population was modeled in detail by *Karen Shih-Hui Hsu* (contractor) and *Joe Silverman*. The model was developed for the Office of Enlisted Strength Planning (PERS-22) to generate monthly forecasts of expected retirements and test alternative retirement policies.

Judicial Employees Management System

The U.S. Federal Courts system maintains substantial personnel and payroll information on its employees. Detailed biographical and career history data for judges, clerks, and hundreds of other types of employees are kept. However, like many organizations, access to these data for analysis and decision-making has been limited. Managers in the Human Resources Directorate of the Administrative Office of the U.S. Courts (AOUSC) received data in often out-dated, inaccurate paper reports, but had no access to the on-line personnel database.

To give AOUSC rapid access to their data, *Roy Jordan* in Code 11 designed and developed the *Judicial Employees Management System (JEMS)*. The system provides summary information (e.g., the number of personnel serving in particular occupations and grades), as well as information particular to groups of individuals (e.g., the names of employees with specific occupations and grades). JEMS allows queries about a wide range of personnel attributes, including grade/step, gender, age, and retirement plan.

JEMS has been implemented as a client-server application exploiting an ORACLE database "engine," a user interface built by Microsoft Excel 4.0, and a link of the database provided by Q+E. The system runs in the WINDOWS 3.1 environment. The system is designed for use by multiple users. JEMS is the first WINDOWS-based, client-server application at AOUSC.

Navy-wide Personnel Survey

VADM J. M. Boorda, the CNP, commissioned the *Navy-wide Personnel Survey (NPS)* in 1990. NPS, with continued sponsorship by VADM Zlatoper, is an annual comprehensive survey designed to assess the attitudes and opinions of Navy personnel regarding important policy issues. NPS "takes the Navy's pulse" on such topics as:

- ☐ Rotation and permanent change-of-station moves
- ☐ Health issues

- ☐ Pay and benefits
- ☐ Educational opportunities
- ☐ Quality of life
- ☐ Organizational climate

Annual sampling of all personnel enables the Navy to identify and analyze trends in opinions and attitudes that materially affect the performance and morale of its members. *Mannie Somer* and *Mary Quenette* are the principal investigators. NPS is in its fourth year of survey data collection, analysis, and reporting.

NPS-93 has just been mailed and results will be analyzed and reported in early calendar year 1994. High level personnel and Admirals' offices are using the quantitative research results from NPS-90, NPS-91, and NPS-92 in speeches and testimony before Congress and in creating, developing, and changing major Navy policies and procedures.

Drug Policy Analysis System

In 1981, the U.S. Navy introduced a zero tolerance drug policy. The cornerstone of this policy was an aggressive program of drug abuse detection and deterrence. NPRDC has been studying the Navy's random urinalysis drug testing procedures since 1991. These studies have produced several products, including the *Drug Policy Analysis System (DPAS)*. The principal investigators for DPAS have been *Ted Thompson* and *Pat Boyle*.

DPAS provides drug policy managers with PC-based software for designing a random urinalysis program that maximizes detection at an activity at minimum cost.

The program manager specifies, interactively, potential policy parameters, including the number of people subject to testing, cost per test, maximum budget available, average time to detection, and other policy criteria. The BUPERS, Navy Drug and Alcohol Program Division (PERS-63) staff has described the model as "elegant and quite useful." Potential users of DPAS include policy makers (PERS-63; DCNO, [Plans, Policy, and Operations, Counterdrug Branch] [N-515]; and the DOD Drug Policy Branch) and policy enforcers (fleet Alcohol and Drug Control Officers [ADCOs] and Drug and Alcohol Program Advisors [DAPAs]).

Strategic Planning Deployment Aid

The Strategic Planning Deployment Aid (SPDA), developed by NPRDC in support of the Navy's TQL effort, is a structured method for deploying an organization's strategic plan through all levels of an organization. SPDA provides instructions, procedures, and a format for translating an organization's strategic goals into specific annual performance plans for organizational units. *Barrie Cooper* and *Paul DeYoung* are the principal investigators.

SPDA includes:

- ☐ An overview of SPDA and the prerequisites for its use
- ☐ An introduction to the SPDA forms, including planning, implementation, and review tables and discrepancy reports
- ☐ An example of SPDA's use in a fictitious organization
- ☐ Blank forms that each organization can copy and use

The organizations that have helped with piloting and drafting the SPDA include: the Naval Air Reserve Center, Whidbey Island, WA and the Fleet Industrial and Supply Center, San Diego.

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- Ryan-Jones, D. L., & Lewis, G. W. (1993, February). *Neural network discrimination of brain activity*. Paper presented at the Artificial Neural Network Conference, San Diego, CA.
- Sands, W. A., & Vicino, F. L. (1993, July). *Dual use technology*. Paper presented at the Technical Cooperation Program, Technical Panel UTP-3 Conference, Plymouth, United Kingdom.
- Sands, W. A., & Folchi, J. (1993, July). *Artificial neural networks for personnel selection*. Paper presented at the Technical Cooperation Program, Technical Panel UTP-3 Conference, Plymouth, United Kingdom.
- Sands, W. A., & Folchi, J. (1993, November). *Comparison of back propagation and regression models for personnel selection*. Paper presented at the 35th annual conference of the Military Testing Association, Williamsburg, VA.
- Sands, W. A., & Moreno, K. E. (1993, July). *Computer-based ability testing*. Paper presented at the Technical Cooperation Program, Technical Panel UTP-3 Conference, Plymouth, United Kingdom.
- Sands, W. A., Trent, T., & Devlin, S. (1993, July). *Compensatory screening model for Navy non-high school diploma graduate applicants*. Paper presented at the Technical Cooperation Program, Technical Panel UTP-3 Conference, Plymouth, United Kingdom.

- Sheposh, J., Dutcher, J. S., Dickason, D., Heller, C., & Love, L. (1993, November). *Relationship between TQM perceptions and empowerment: A longitudinal analysis*. Paper presented at the 35th annual conference of the Military Testing Association, Williamsburg, VA.
- Tatum, B. C. (1993, August). *The effects of fixed versus continuous-improvement goals on productivity and affective reaction*. Paper presented at the annual meeting of the Academy of Management, Atlanta, GA.
- Thomas, M. D. (1993, August). *How men and women view sexual harassment*. Paper presented at the 101st annual meeting of the American Psychological Association, Toronto, Canada.
- Thomas, M. D., Booth-Kewley, S., & Ellis, N. M. (1993, August). *Emotional responses to pregnant Navy women in the work place*. Paper presented at the 101st annual meeting of the American Psychological Association, Toronto, Canada.
- Thomas, P. J. (1993, August). *Measuring sexual harassment: How should rates be determined?* Paper presented at the 101st annual meeting of the American Psychological Association, Toronto, Canada.
- Trejo, L. J., & Shensa, M. J. (1993, November). *Linear and neural network models for predicting human signal detection performance from event-related potentials: A comparison of the wavelet transform with other feature extraction methods*. Paper presented at the 1993 International Simulation Technology Multiconference, San Francisco, CA.
- Trejo, L. J. (1993, February). *Pattern recognition neural networks for human event-related potentials (ERP): A comparison of feature extraction methods*. Paper presented at the Artificial Neural Network Conference, San Diego, CA.
- Trent, T., & Devlin, S. (1993, November). *Navy recruit training performance of high school dropouts*. Paper presented at the 35th annual conference of the Military Testing Association, Williamsburg, VA.
- Ulozas, B. (1993, May). *Development of a virtual environment damage control training prototype*. Paper presented at the 7th annual meeting of DOD Technical Training Technology Group, Orlando, FL.
- Wolfe, J. H. (1993, August). *The Enhanced Computer Administered Test (ECAT) battery validity*. Paper presented at the 101st annual meeting of the American Psychological Association, Toronto, Canada.
- Wolfe, J. H., & Larson, G. E. (1993, August). *Factor validities for the Enhanced Computer Administered Test (ECAT)*. Paper presented at the 101st annual meeting of the American Psychological Association, Toronto, Canada.

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